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RICE

S. A. KNAPP

About 1885 some optimistic farmers in Louisiana conceived the idea that improved agricultural machinery could be adjusted to the rice industry and rice husbandry could be modernized along all lines. It required some years of invention and experiment to adapt and adjust the monarchs of the wheat farms to an aquatic plant, but once accomplished, a new era dawned upon the Gulf states. If rice was to be cultivated by Oriental methods, the Occident must soon cease to produce it, for its labor was too expensive and intelligent to compete. The great reduction in ocean freights in the last half century and the more rapid transit added further peril to this industry. The possibility of using agricultural machinery in the rice fields changed the situation, and furnished the American farmer with the means for successful competition.

The present status of the rice industry in the United States is, from a productive stand-point, that the American farmer with high intelligence, complete mechanical devices, virgin lands and control of the best market in the world, is arrayed in the conflict of the industries against the ignorance of the masses, hand cultivation of the crop, semi-impoverished soils and markets that are held to the lowest point by the encroachments of poverty. While these are strong vantage grounds we should take nothing for granted, but carefully inquire, does the production of rice rest upon conditions that will compel its culture, or is the growing of rice now merely temporary direction given to industry, which some other product

will ultimately displace. Is there in the conditions here a legitimate place for the production of rice, and when produced will it meet any of the requirements of our people for better sustenance?

There are vast tracts of land along the Atlantic and Gulf coasts and in the interior that cannot be used for agricultural purposes without the thorough drainage and aeration of the soil. But this complete drainage is too expensive. Our people cannot afford to allow such large areas to remain unproductive. If perfect drainage is too expensive, the problem then is to find some plant that can prosper under existing conditions. Rice is one of the few cereals that can thrive in soils with some acidity and of excessive humidity. For this reason, if for no other, rice has become or will become an important factor in the agriculture of every nation which has territory situated in the southern temperate or in the torrid zones.

Under the systems of agriculture followed in the centuries that have elapsed, the upland soils devoted to the production of wheat, barley and oats, have gradually declined in fertility till in some countries, as in China, large tracts have been turned to commons. Not so with rice lands. For thousands of years they have yielded their annual crops and will doubtless furnish food for the nations in centuries to come. This has been credited to the inherent richness of the lands devoted to rice, to the lighter exhausting effects of the rice crop, and to the renovating character of shallow standing water all of which have some bearing. Water is a marvelous absorbent of volatile fertilizers, which to some extent impregnate the atmosphere in warm weather. These with such as arise from the cultivated lands of

the rice fields are retained by the water and restored to the soil for future use.

Another reason why nations must depend upon rice as one of its staples is the certainty of the crop. When density of population has created a demand equal to the usual product of the country's harvest, failure of the crop is a national disaster. In India or China even a partial loss imperils the lives of millions. Wheat, corn and barley may fail, and do fail occasionally with the change in seasons, but rice with a supply of fresh water always gladdens the farmer with the reward of toil. The large average resources of the American farmers and their wide diversity of products cause the partial loss of a single crop to be viewed with less dismay than among older nations, but the time is approaching when we shall need to husband all our resources and guard against disaster in the harvest.

The amount of food that can be produced per acre has an important bearing upon the selection of a standard crop. No crop responds more readily to good cultivation than rice, or more abundantly repays in the harvest all care bestowed. The coast region of our Gulf states does not take kindly to corn. With proper drainage to remove the acid from the soil, corn can be produced in remunerative quantities, but all things considered it is an expensive crop in the South. Wheat, oats and barley are winter crops and should follow rice. Rice is pre-eminently the summer grain crop of the semi-tropical Gulf coast. Climate and soil are adapted to its production. It tends to diversify and balance the agricultural products in the great fiber producing states. The by-products from milling are among the most palatable and nutritious of stock foods, and the straw if prop-

erly utilized for the food of domestic animals or for paper pulp, is worth a sum per acre nearly equal to the cost of producing the crop. In the waste of the farm lies the fortune of the farmer.

As a human food it has been common for English-speaking people to pass it lightly with the remark that it is deficient in nitrogen or frame building material. Properly understood this is one of its excellencies, for most foods are unbalanced and it is easier to make a perfect nutritive ration by basing it on an unbalanced food, as rice, than upon a balanced food as wheat. When we add to the wheat, lean meat, pork, eggs, beans, or butter, we have deranged the ratio and constructed a combined food, uneconomical because out of proportion. With rice we can make a perfect ration by the addition of lean meat, eggs or legumes. Wheat bread can then be used at pleasure, because it does not materially alter the proportion. Rice furnishes a larger amount of energy than any of the other cereals with the least tax upon the system in digestion. The substitution of machinery for handicraft has lightened the labor of our people and reduced the hours of toil. The ability with the use of machinery, to produce an abundance allows the maturing family to live without hard labor. Life is less strenuous than half a century ago so far as it taxes muscular effort, requiring less food for frame repair and more food for potential energy. With these radical changes in what is required to properly nourish the body we have continued to select and consume our foods as if we were still at hard labor and thousands are suffering the penalties of violated law. The easily digested, energy imparting rice, if allowed to form an essential part of our diet, will correct many of the ills from which we

suffer. It is a common saying that in rice eating nations the people are smaller and possess less vigor than in those which largely have a diet of wheat, the inference being that the alleged physical inferiority is due to eating rice. It is true that some rice eating people are small and indolent, but in every instance it can be traced to other causes than rice. No people subsist on an exclusive diet of rice. The proper proportions of nitrogenous foods are almost invariably added. Insufficient quantity of food, the custom of sitting upon the limbs, thus impeding the circulation of the blood, and unsanitary conditions are responsible for any inferior physical development observed in Oriental nations. It is demonstrated that such of the rice eating Orientals as are abundantly fed are physically well developed, have superb health, great mental and physical vigor, and can endure more severe labor and for a longer and more continuous period than the hardiest races of the Occident. Wounds received by them heal as upon healthy animals. They defy malaria and are not subject to blood poisoning.

In our ignorance of rice we have fallen into three economic errors. 1st. Too rapid sale of the crop. 2d. Method of milling. 3d. Preparation of rice as a food.

1st. Rice as a food is improved by age. In India it is stored a year before it is sold to Europeans for consumption. For the use of the native population it is partially cooked before milling after which it undergoes a ripening process. In the United States it is rushed upon the markets direct from the thresher as if it were not necessary for the cereals to have time for a ripening process similar to the changes in fruits.

2d. Most of the essential oils and much of the protein of rice are stored on the surface of the kernel. The

removal of this brownish coating by friction gives a pearly whiteness and a luster to the kernel which captivate the eyes of the American house-wife, but this is secured at a loss of flavor and protein which renders it less appetizing, less digestible and decreases its frame repairing capacity.

3d. Except among the native population of the Carolinas and Georgia, and the creoles of Louisiana I have found in the United States no apparent knowledge of when to use and how to prepare rice for food. In the North it appears as a desert, in the West as lonely grains in a sloop, in Louisiana it is a complete meal and a banquet. It is served on the tables of common people and in the banquet halls. There it is a staple food and not a luxury.

We are now prepared to discuss the economic production of rice under the new conditions and the probability of its becoming a staple food. A comparison of the number of days work necessary to produce an acre of rice in Japan, in India, in the Philippine Islands and in the United States conveys a vivid impression of the great value of machinery in the production of this cereal. That eminent authority on all economic questions, Sir George Watt, gives in detail the cost of producing rice in Bengal, by which it appears that it requires eighty days labor and the use of a yoke of oxen twenty-one days to produce, harvest and thresh an acre of rice. In Japan, the Imperial Agricultural College places the total labor on one acre at 120 days, without the aid of any domestic animals. In the Philippine Islands the cultivation of rice is almost identically upon the plan of India, except that the water buffalo is substituted for the ox, to the detriment of progress. Possibly not quite

so many days labor are bestowed upon the crop, but the yield is correspondingly less. The labor of one man eighty days and the use of a yoke of water buffaloes twenty days would represent the time and effort to produce an acre of rice. In the rice belt of Louisiana and Texas the labor of a man two days and the use of a team one and one-half days form the maximum expenditure of effort on one acre of rice. The equation of human labor then stands as forty and sixty to one in favor of the United States, and the principal factor producing this result is American farm machinery intelligently handled. Stated in terms of the product and omitting animal aid, in India eighty days of human labor in a rice field produce 1000 pounds of rice, in the Philippines 900 pounds, in Japan allowing for teams, 3000 pounds, and in Louisiana or Texas 64,800 pounds. Expressed in pounds, a day's labor in India produces $12\frac{1}{2}$ pounds of paddy rice; in the Philippines, $11\frac{1}{4}$; in Japan, $37\frac{1}{2}$; in United States, 810. This indicates that the American farm laborer produces nearly sixty-four times as much grain as his Oriental competitor and could be allowed \$1.20 per day as a wage on the basis of two cents per day for the Indian farmer, assuming that the same price per pound is paid in both countries, which is far from true. The American farmer receives for his product nearly double the sum allowed the Indian ryot. Add to our better market the producing power of our virgin soil, and it would seem that our farmers stand upon a vantage ground from which no competition can displace them. This optimistic view is the result of canvassing conditions from one stand-point—productive power.

The moment rice leaves the farmer it undergoes a marvelous increment in price at the hands of everyone

that touches it, the miller, the transportation lines, the broker, the wholesaler and the retailer, until the article that left the farmer as a staple food at moderate prices has by the time that it is offered to the consumer become a luxury too costly for the masses. The rice grains leave their humble birth-place on the Louisiana farms at the modest price of 2 to 3 cents per pound, but are offered to the consumer in most states at the prohibitive price of 8 to 12 cents per pound, a gain of 6 to 9 cents per pound from the producer to the consumer. Wheat, a product of Northern states, is milled, transported to Louisiana and sold to the consumer on a margin of $\frac{3}{4}$ of a cent to 1 cent per pound above the price paid the producer. It is thus observed that the farmers are thwarted in their efforts to popularize rice and place it upon the markets of the United States as a staple food by the exactions of commerce. But the battle of the industries is not at an end, and this with kindred difficulties will eventually be overcome by the wisdom and the energy of American farmers.